Design of Optical Filter in Rod-type Photonic Crystal Slab

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We present a design of an optical filter to realize an optical add-drop multiplexer by using a rod-type photonic crystal (PC) slab. The structure of an optical filter in a rod-type PC slab is shown in Fig.1. The PC slab consists of square lattice of Si rods embedded in polymer layer and an underlying SiO_2 layer. In order to form an optical filter, a row of the rods is replaced by a Si channel with a rectangular crosssection.

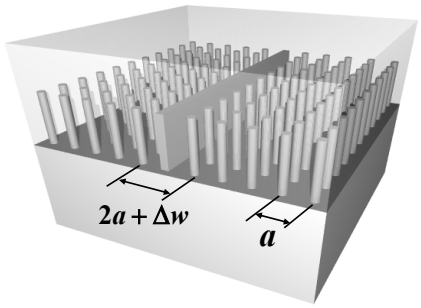

Fig.1: Structure of Optical Filter

According to our dispersion relation calculations, a wide interval between neighboring rods ($2a + \Delta w$) results in a small stop band because the influence of the periodicity of the PC to waveguide modes becomes small. $\Delta w \geq a$ is required for a stop band smaller than 1nm.

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